REMARKS

An Excess Claims Fee Payment Letter and fee for excess claims is herewith enclosed.

Claims 1-23 are all the claims presently pending in the application. New claims 20-23 have been added to more completely define the invention. Applicant gratefully acknowledges Examiner's indication that claims 1-8 and 12-19 are allowed and that claims 10-11 are allowable if rewritten in independent form.

It is noted that the claims have been amended solely to more particularly point out Applicant's invention for the Examiner, and not for distinguishing over the prior art, narrowing the claim in view of the prior art, or for statutory requirements directed to patentability.

It is further noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. The attached pages are captioned "**Version with markings to show changes made**".

With respect to the prior art rejections, claim 9 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Koma (U.S. Patent No. 6,157,428) (hereinafter "Koma").

This rejection is respectfully traversed in the discussion below.

I. THE CLAIMED INVENTION

Applicant's invention, as defined for example in independent claim 9, is directed to a liquid crystal display where each pixel is formed of a plurality of differently oriented regions of an alignment layer.

A feature of the invention is that the pixel includes an electrode with at least one aperture formed along a boundary between adjacent differently oriented regions in an alignment layer deposited on top of the electrode and in the aperture.

Additionally, the aperture is formed inside the pixel.

With such features, a superior quality display having a high-speed response time and a

low incidence of poorly oriented regions can be provided (e.g. see page 11, lines 25-27; page 12, lines 1-10; and page 13, lines 7-22).

An exemplary configuration of the aperture formed along a boundary between adjacent differently oriented regions is shown in Figs. 4 and 6 of the application.

The conventional systems, such as those discussed below and in the Related Art section of the present application, do not have such a structure, and fail to provide for such an operation.

Indeed, such features are clearly not taught or suggested by the cited references.

II. THE PRIOR ART REJECTIONS

A. The Koma Reference

The Examiner asserts:

> *[regarding claim 9] Koma teaches (Fig. 17) an LCD with each pixel being formed of a plurality of differently oriented regions of an alignment layer comprising an electrode 109 with at least one aperture formed along the boundary between adjacent differently oriented regions in an alignment layer 110 that is deposited on top of the said electrode and also in the said aperture, with the said adjacent, differently oriented regions orienting the respective liquid crystal molecules to be vertical or almost vertical when no electric field is applied via the said electrode.*

However, Applicant respectfully disagrees and submits that the Examiner's assertions that Koma anticipates the present invention are erroneous.

Firstly, in the present invention, as shown in the non-limiting embodiment of Figs. 4 and 6, an aperture 5 is formed along the boundary between adjacent differently oriented regions (e.g., region A and region B) in an alignment layer to prevent orienting liquid crystal poorly at the boundary region. That is, in a non-limiting embodiment of the present invention, the aperture 5 is formed inside a pixel.

In complete and fundamental contrast, while the Examiner asserts that Koma

discloses in Fig. 17, a pixel electrode 109 which appears to have an aperture, according to Fig. 16 which shows a plane view of the structure in Fig. 17, the aperture (if any) in the electrode 109 is merely a gap between a pixel and the neighboring pixel. Thus, Figs. 16-17 of Koma only show that a gap (e.g., the "aperture" in the electrode 109) is not formed inside a pixel. Thus, Koma does not teach or suggest "*each pixel being formed of a plurality of differently oriented regions of an alignment layer, comprising an electrode with at least one aperture*"(emphasis Applicant's), as in the claimed invention defined by claim 9.

Moreover, Koma teaches that an aperture (e.g., orientation control window 122) is formed in a common electrode 121 on an opposing transparent substrate 120. That is, "*[a]bove the film 110, a liquid crystal layer 130 is provided, with a common electrode 121, made of ITO, further provided on the layer 130. In common electrode 121, an orientation control window 122 is made having no ITO electrodes formed within*" (e.g., see column 11, lines 38-42 of Koma). However, Koma does not teach or suggest a differently oriented alignment layer in the common electrode. Therefore, the aperture (if any) of Koma is not formed along the boundary between adjacent differently oriented regions in an alignment layer. Accordingly, Koma does not anticipate or, for that matter, render obvious the claimed invention as defined by independent claim 9.

Hence, turning to the clear language of independent claim 9, Koma neither teaches or suggests "*[a] liquid crystal display (LCD) with each pixel being formed of a plurality of differently oriented regions of an alignment layer, comprising an electrode with at least one aperture formed along the boundary between adjacent differently oriented regions in an alignment layer that is deposited on top of said electrode and also in said aperture, with said adjacent, differently oriented regions orienting the respective liquid crystal molecules to be vertical or almost vertical when no electric field is applied via said electrode*" (emphasis Applicant's).

For the reasons stated above, claim 9 of the claimed invention is fully patentable over the cited references.

In addition, new claims 20-23 are also fully patentable by virtue of the novel and unobvious features and limitations which they recite.

Further, the other prior art of record has been reviewed, but it too even in combination (arguendo) with Koma fails to teach or suggest the claimed invention.

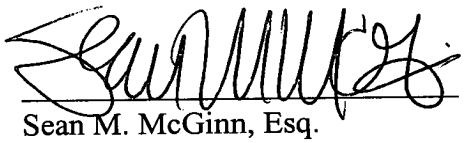
III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1-23, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims have been amended as follows.

1. (Amended) [An LCD] A liquid crystal display (LCD) with each pixel being formed of a plurality of differently oriented regions of an alignment layer, comprising an electrode [(3)] with at least one aperture [(5)] formed along the boundary between adjacent differently oriented regions in an alignment layer [(10)] that is deposited on top of [the] said electrode [(3)] and also in [the] said aperture [(5)], with [the] said adjacent, differently oriented regions orienting the respective liquid crystal molecules [(14, 15, 16)], wherein the shortest allowable width [W] of [the] said aperture [(5)] is equal to the width [(X)] of the defectively oriented region in [the] said boundary.

2. (Amended) The LCD, according to claim 1, wherein the longest allowable width [(W)] of [the] said aperture [(5)] is equal to the width of [the] said boundary.

3. (Amended) The LCD, according to claim 1, wherein [the] said alignment layer [(10)] orients the liquid crystal molecules [(14, 15, 16)] to be vertical or almost vertical when no electric field is applied via [the] said electrode [(3)].

4. (Amended) The LCD, according to claim 1, wherein [the] said electrode [(3)] is comprised of a broken line of a plurality of apertures [(5)] along [the] said boundary.

5. (Amended) The LCD, according to claim 1, further comprising a second electrode [(4)], which faces [the] said electrode [(3)] at a certain distance, and a second alignment layer [(11)], which is deposited on [the] said second electrode [(4)] and is comprised of a second boundary and differently oriented regions sandwiching [the] said second boundary, wherein [the] said second boundary is aligned at almost the same horizontal location as that of the boundary in the alignment layer [(10)].

6. (Amended) The LCD, according to claim 5, wherein [the] said second electrode [(4)] is comprised of a second aperture [(5')] that is aligned so as not to be located at the same horizontal location as that of the aperture [(5)] on [the] said electrode [(3)].

7. (Amended) The LCD, according to claim 6, wherein the shortest allowable width of [the] said second aperture [(5')] is equal to the width of a defectively oriented region in [the] said second boundary.

8. (Amended) The LCD, according to claim 7, wherein the longest allowable width of [the] said second aperture [(5')] is equal to the width of [the] said second boundary.

9. (Amended) [An LCD] A liquid crystal display (LCD) with each pixel being formed of a plurality of differently oriented regions of an alignment layer, comprising an electrode [(3)] with at least one aperture [(5)] formed along the boundary between adjacent differently oriented regions in an alignment layer [(10)] that is deposited on top of [the] said electrode [(3)] and also in [the] said aperture [(5)] , with [the] said adjacent, differently oriented regions orienting the respective liquid crystal molecules [(14, 15, 16)] to be vertical or almost vertical when no electric field is applied via [the] said electrode [(3)].

10. (Amended) The LCD, according to claim 9, wherein the shortest allowable width [(W)] of [the] said aperture [(5)] is equal to the width [(X)] of a defectively oriented region in [the] said boundary.

11. (Amended) The LCD, according to claim 10, wherein the longest allowable width [(W)] of [the] said aperture [(5)] is equal to the width of [the] said boundary.

12. (Amended) A method of fabricating [an LCD] a liquid crystal display (LCD), comprising [the following steps]:

[an aperture forming step (S1) of] forming at least one aperture [(5)] along a to-be-formed boundary on an electrode [(3)], which has been placed on top of a substrate [(1)], with the width [W] of the said aperture [(5)] being equal to or longer than the expected width [(X)] of the

defectively oriented region in a boundary that is to be generated later;

[a depositing step (S2) of] depositing an alignment layer [(10)] over the resultant surface processed in forming the at least one aperture [forming step]; and

[a generation step (S2) of] generating differently oriented regions, which orient respective liquid crystal molecules, and [the] said boundary, which is sandwiched between [the] said differently oriented regions, all in [the] said alignment layer [(10)].

13. (Amended) The method of fabricating an LCD, according to claim 12, wherein the width [(W)] of [the] said aperture [(5)] is equal to or shorter than the width of [the] said boundary.

14. (Amended) The method of fabricating an LCD, according to claim 12, wherein the generated, differently oriented regions orient the respective liquid crystal molecules to be vertical or almost vertical when no electric field is applied via [the] said electrode [(3)].

15. (Amended) The method of fabricating an LCD, according to claim 12, further comprising a second generation step [(S4)] of generating a second group of differently oriented regions, which orient the respective liquid crystal molecules, and a second boundary, which is sandwiched between [the] said second group of differently oriented regions, all in a second alignment layer [11], which has been deposited on a second electrode [(4)], in such a manner that the differently oriented second regions [can be aligned] are alignable in consistency with the oriented directions of the differently oriented regions in [the] said alignment layer [(10)] generated in [the] said generation step [(S2)] and such that the second boundary can horizontally fit the boundary generated in the generation step [(S2)].

16. (Amended) The method of fabricating an LCD, according to claim 15, further comprising a second aperture forming step of forming at least one second aperture [(5')] on [the] said second electrode [4] along [the] said second boundary.

17. (Amended) The method of fabricating an LCD, according to claim 16, wherein [the] said second aperture forming step forms a broken line of a plurality of second apertures [(5')] on [the] said second electrode [(4)] along [the] said second boundary.

18. (Amended) The method of fabricating an LCD, according to claim 16, wherein [the] said second aperture forming step forms concave, second aperture [(5')] on [the] said second electrode [(4)] along [the] said second boundary.

19. (Amended) The LCD, according to claim 4, wherein the total length of [the] said broken line of the plurality of aperture [(5)] is equal to or greater than one-third the length of [the] said boundary.

New claims 20-23 have been added.

-- 20. A liquid crystal display (LCD), comprising:

a plurality of pixels, each pixel of said plurality of pixels being formed of a plurality of differently oriented regions; and

an electrode with at least one aperture formed along a boundary between adjacent differently oriented regions;

wherein a minimum width of the at least one aperture is equal to a width of a defectively oriented region in the boundary.

21. The LCD, as claimed in claim 20,

wherein the plurality of differently oriented regions are formed of an alignment layer, and

wherein the alignment layer is deposited on said electrode and in the aperture.

22. A method of fabricating a liquid crystal display (LCD), comprising:

forming at least one aperture on an electrode;

depositing an alignment layer over the resultant surface processed in said forming at least one aperture; and

generating differently oriented regions and a boundary between said differently oriented regions in the alignment layer.

23. The method as claimed in claim 22, wherein a width of the at least one aperture is equal to or greater than a width of a defectively oriented region in said boundary. –